Conventional Ammunition Demilitarization (Demil) — A Growing Challenge

LTC Brian W. Raftery

As the Single Manager for Conventional Ammunition, the Army has demil responsibility for DOD conventional ammunition. This includes storage, surveillance, demil and disposal of DOD's excess, obsolete and unserviceable ammunition, including conventional munition items, tactical missiles and large rocket motors. Also, the Army is charged with planning, programming and budgeting. Obtaining the resources to reduce the demil stockpile is the single biggest challenge.

Here, 81mm mortar rounds undergo demil treatment in an Ammunition Peculiar Equipment 1401 Autoclave Meltout Facility. (Photo by Sam King, The CSI Group.)

Size Matters

The current demil stockpile is estimated at almost 480,000 short tons of conventional ammunition and more than 300,000 missiles and missile components. At an approximate cost of $1,800 per ton to demil this stockpile with future additions or generations, the demil liability to DOD is almost $2 billion through the current budget and program years. At the current funding level, the stockpile, instead of getting smaller, continues to grow.

Most of the demil stockpile is stored and maintained by the U.S. Army Joint Munitions Command (JMC) at its major depots and ammunition plants, where they also receive, store and outload ammunition in direct support of the warfighter. The presence of demil stocks in the same place as the critical mission and training stocks results in storage inefficiencies, increased costs and decreased opportunity to apply Lean Six Sigma (LSS) principles to improve efficiency.

In addition, under the Base Realignment and Closure program, the JMC lost a significant amount of covered storage space without a corresponding decrease in stored stockpile. Demil is more critical than ever to ensure that excess, obsolete and unserviceable munitions items do not consume valuable covered storage space. In this regard, the JMC is the Demil Program's major customer. In fact, for every ton of conventional ammunition demilitarized, approximately 7 to 9 square feet of covered storage space can be opened to store ammunition required by the warfighter.

At current funding levels, the demil stockpile is expected to grow to more than 500,000 tons by 2013. As the stockpile is demilitarized, the munitions toward the end of the queue are more complex than those currently being demilitarized, further exacerbating the

problem. This increased complexity results in increased cost, so tomorrow's demil dollar will potentially buy less in terms of the number of items demilitarized. The trend over the last few decades has moved from the more traditional and less complex open burn or open detonation (OB/OD) demil techniques to more complex and more costly Closed Disposal Technology (CDT) and Resource Recovery and Recycling (R3) methods.

Environmental considerations have resulted in the current Demil Program operating at CDT or R3 levels of 85 percent or higher and OB/OD at 15 percent or less. Additionally, CDT and R3 capabilities generally require a capital investment to develop and purchase hardware, as well as the normal level of operational funding to actually execute demil. Thus, it would seem that operating at a high level of CDT and R3, although more environmentally responsible, results in diminishing marginal returns.

> At an approximate cost of $1,800 per ton to demil this stockpile with future additions or generations, the demil liability to DOD is almost $2 billion through the current budget and program years. At the current funding level, the stockpile, instead of getting smaller, continues to grow.

Recycling Has Potential to Lower Costs, Expand Effort

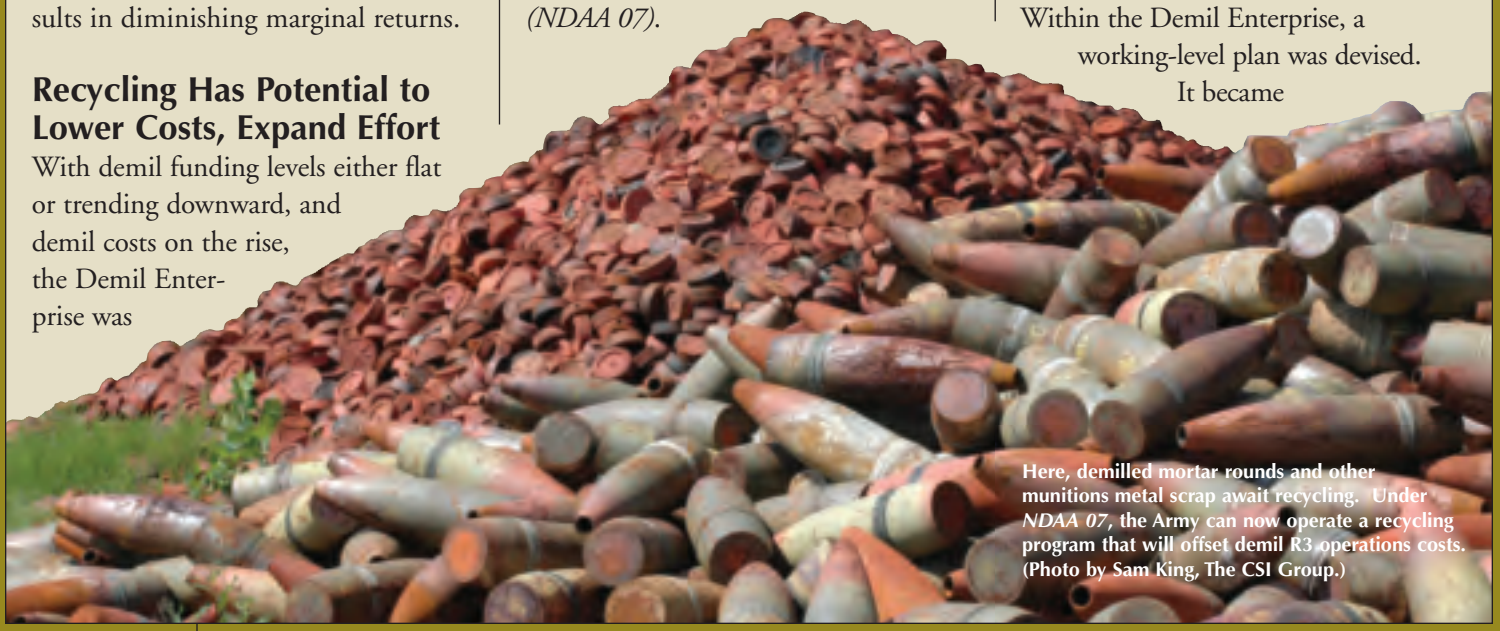
With demil funding levels either flat or trending downward, and demil costs on the rise, the Demil Enterprise was forced to look for ways to reduce costs. One potential answer was finding markets for demil operations recyclable components and end products, much the way the commercial recycling industry does. This involved several challenges, not the least of which would require statutory relief for the Demil Program to directly reinvest the proceeds of R3 operations back into the program. While demil operations were already producing millions of pounds of marketable metals and energetics every year, there was no way to effectively see and direct monetary benefit back into the program. This would require changing the law.

The U.S. Army Materiel Command (AMC) G-3 and Command Counsel crafted language that would do just that. After a concerted effort by the Army, this language was codified into law through the *John Warner National Defense Authorization Act for FY07 (NDAA 07)*.

With *NDAA 07* passage, the Army has the legal authority to establish and operate a recycling program that will benefit the Demil Program by offsetting demil R3 operations cost. While considerable, this accomplishment is just a first step in establishing and operating a program to help achieve the statute's intent. Now that the Army has this legal authority, it can sell recyclable munitions materials resulting from demil and reinvest the proceeds into demil R3 operations. Proceeds from the reinvestment are estimated at $2-3 million annually.

In close coordination with AMC G-3 and Command Counsel, the Demil Enterprise Partners (Product Manager (PM) Demil); JMC; the U.S. Army Defense Ammunition Center; the U.S. Army Armament Research, Development and Engineering Center; and the U.S. Army Aviation and Missile Command G-3, as well as the Army G-4 and the Assistant Secretary of the Army for Acquisition, Logistics and Technology, started implementing the new statute as quickly as possible. A Department of the Army (DA)-level policy would be required when the bill's final version was received, as well as an implementation plan.

Within the Demil Enterprise, a working-level plan was devised. It became

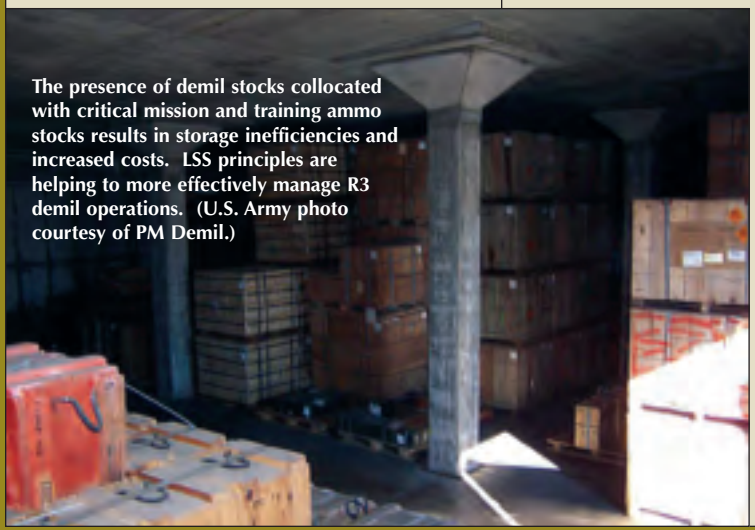


Here, demilled mortar rounds and other munitions metal scrap await recycling. Under *NDAA 07*, the Army can now operate a recycling program that will offset demil R3 operations costs. (Photo by Sam King, The CSI Group.)

With current demil stockpiles estimated at 480,000 short tons, coupled with the high operations tempo associated with the global war on terrorism, demil stockpile tonnage is expected to grow to more than 500,000 tons by 2013. Inadequate resourcing and storage, handling and shipping challenges exacerbate the situation. The demil community has responded with creative and innovative LSS processes to address the situation. With the passage of *NDAA 07*, additional revenues from recyclables are being put directly into R3 operations. (U.S. Army photo by SPC Clydell Kinchen, 55th Signal Co. (Combat Camera).)

clear early on that the JMC installations would be critical planning partners and, for it to be successful, the installations would have to receive incentives for marketing work to generate the revenue in the first place. A cost-sharing arrangement would have to be established that provided monetary benefit to the installation performing the work. This would take the form of a 40-percent return of the proceeds harvested by the installation for future demil R3 projects or capabilities. The remaining 60 percent would be for demil reinvestment for similar activities for the Demil Program at large. The intent was that 100 percent of the proceeds would be used to offset demil R3 projects costs. Additionally, a financial accounting system was established to maintain revenue management control and accountability.

The DA G-4 drafted, staffed and published a DA-level message that effectively served as the interim regulation required by statute to implement the plan. This message codified the key tenets of the operational plan previously described, as well as established overall applicability. At this time, only CONUS installations are eligible to participate. When this message was published in May 2007, the Demil R3 Program was established and the first revenue checks were deposited in the centrally managed account.



The presence of demil stocks collocated with critical mission and training ammo stocks results in storage inefficiencies and increased costs. LSS principles are helping to more effectively manage R3 demil operations. (U.S. Army photo courtesy of PM Demil.)

Where Do We Go From Here?

While the new legislation does offer potential in terms of cost reduction for demil R3 programs, more is needed. Reducing the demil stockpile must be adequately funded. While selling demil recyclable derivatives can help offset costs, it doesn't pay the whole cost, nor does it apply to the entire stockpile. Additionally, many items are too small or complex to effectively recycle; other derivatives produce little or no value, like commercial glass, which is cheaper to produce new.

The new law complements two existing demil initiatives: the Demil Research and Development (DRD) Program and the Design for Demil (DFD). DRD has major thrust areas focusing on disassembly and reusing existing munitions. DFD seeks to influence future munitions design for easier disassembly. Both of these initiatives can help maximize the recycling value of demil residual products by reducing the cost of a more valuable end product. By using LSS principles, existing processes can be tuned to return higher yields on existing R3 projects. With new leverage provided by the new law, we can increase current demil program effectiveness and enhance demil R3 economic viability.

LTC BRIAN W. RAFTERY is the PM Demil within Program Executive Office Ammunition. He holds a B.S. in mechanical engineering from the U.S. Military Academy where he was the 1987 recipient of the COL James L. Walsh Memorial Award for Excellence in Mechanical Engineering, an M.S. in mechanical engineering from Pennsylvania State University and an M.A. in procurement and acquisition management from Webster University. Raftery is a Defense Acquisition University Materiel Acquisition Management Course and Program Management Certification course graduate.